



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

mountains the piedmont plateau, but little dissected, consists of upturned and planed-off Mesozoic and Tertiary strata; and the coastal plain down to the ocean is a flat featureless plain of very recent deposits. The rivers are parallel and closely spaced, all flowing across mountains, plateau, and plain to the Arctic Ocean; they give the impression of simple subsequent streams, though their origin is not entirely clear. There seems to have been no deformation of the region at the end of the Paleozoic; but since Jurassic or Cretaceous times, and to the end of the Tertiary, it has suffered many disturbances with more or less pen-planation in between.

The description of the general erosion of the region and of the formation of sand bars and spits along the coast, etc., indicates no material difference from temperate regions; but in the frozen ground of the tundra we find a phenomenon peculiar to the far north.

The subject of ground ice and frozen ground is treated very fully. The observations of previous writers are summed up and largely quoted. Middendorff's studies of the Schergin shaft in Siberia, which are not easily accessible, are given in some detail. This shaft was sunk at Yakutsk, Siberia, in the early part of the last century with the hope of finding water for the town, but it did not penetrate below the frozen ground even at a depth of 382 feet. In 1844-1846 Middendorff made extensive observations on the temperature in the wall of the shaft at various depths below the earth's surface. The general result showed a temperature gradient which flattened out with depth and seemed to indicate, by its steeper gradient near the surface, that the mean annual temperature of Yakutsk had been recently lowered by nearly 5° C. at the time of Middendorff's observations. In Alaska several shafts have been sunk about 200 feet, and one reached 365 feet, without penetrating below the frozen ground. Various theories as to the origin of this condition are discussed, and the attempt is made to determine the age from the temperature gradient; but with little success, for much detailed data are needed which are not available. Nevertheless the attempt is interesting and may sometime yield more definite results. The "ground ice wedge" is an interesting form which is apparently widespread in the northern tundra. The ice occurs in the form of wedges very free from mixture of earth. They are ten or twenty feet across at the top, a few feet below the surface of the muck, and narrow out below, apparently disappearing at a depth of twenty or thirty feet. The author connects them with the frost cracks which form with loud reports in the ground during the great cold of winter; later, water flows into these cracks and freezes; and, as the whole warms up during the summer, the expansion squeezes up the sand and clay on the sides and so produces a slightly uneven land surface broken into polygonal blocks, the frost cracks occupying the depressions between them. This process continues year after year, and the ice wedges grow in size.

Many details and interesting descriptions of ground ice, sea ice, and ice formed by the rivers and domed up under hydraulic pressure are given; but they must be passed over with a mere reference.

The difficulties Mr. Leffingwell encountered were serious. In summer he had to be his own pack horse, which interfered greatly with his excursions into the mountains; in winter, when journeys could be taken by sleds, the snow covered much that he wanted to see. One must admire the energy and enthusiasm with which he stuck to his purpose, going back year after year, improving and broadening his observations in the face of many obstacles. It is by just such persevering work as his that knowledge of the difficultly accessible regions of the earth is becoming definite.

HARRY FIELDING REID

A TEXTBOOK OF AUSTRALIAN METEOROLOGY

GRIFFITH TAYLOR. **Australian Meteorology: A Text-Book including Sections on Aviation and Climatology.** xi and 312 pp.; maps, diagrs., index. Clarendon Press, Oxford, 1920. \$5.65. 8½ x 5½ inches.

Meteorologists the world over will welcome this excellent book which throughout is characterized by that originality and stimulation with which the readers of the *Geographical Review* are already familiar in Dr. Taylor's contributions. The work is primarily intended as a general textbook for students of meteorology and climatology in Australia, but, unlike most textbook writers, Dr. Taylor has written for foreign readers quite as much as for those at home. There are many valuable suggestions to the teacher, particularly on the advantage of using Australia as a climatic model to show the temperature and rainfall effects of the seasonal migrations of the sun, and, in turn, the control of the resulting climates over the

industries and distribution of population in Australia. Principles therein discovered could then be applied to the more complex climatic environments of other parts of the world. For such a comparative purpose the book is well fitted. Thus, in discussing climatology Australian homoclimates, *i.e.* the climates, products, and types of people in corresponding climates elsewhere, are cited. A world map of Herbertson's natural regions revised for Australia is presented. This chapter is admirable as an essay on comparative human climatology. Many of its interesting points are discussed more fully in the article "Agricultural Climatology of Australia" of which an abstract is given elsewhere in this number of the *Review*.

Of considerable interest also are the chapter on "Aviation and Meteorology," based largely on his own and his aviator-students' experiences, and that on "The Origin of the Tropical Lows in Australia." The low-pressure areas here dealt with form as buds from the two foci of practically permanent low pressure in summer in northern Australia. Dr. Taylor thinks that broad "convection domes" of heated air build up over these regions and from time to time have their summits torn off by the northwest anti-trades aloft and that these warm masses, having been given an eddying motion while being detached, reduce the pressure in the strata below and thus bring about the establishment of separate cyclones. He thinks that this convection-dome theory is also adequate to explain the origin of those extra-tropical cyclones which bud off from the other major centers of convection of the world, *i.e.* the low-pressure "centers of action."

There are few portions of the book open to adverse criticism. As in most textbooks on meteorology, the chapter on clouds and their origin is unsatisfactory, chiefly because of its brevity. In explaining how clouds originate, the common method, by mixture, is not even mentioned.

Two appendixes show the "Topographic Control of Rain in S. E. Australia" and "Temperature and Rainfall Averages for Australian Towns." In the front cover is a workable solar-control model; at the end a full index. Illustrations to the number of 229, most of them drawn by the author, vivify the text.

CHARLES F. BROOKS

PAPERS ON THE TIDES

W. B. DAWSON. **The Tides and Tidal Streams, with Illustrative Examples from Canadian Waters.** 43 pp.; diags., ills. Dept. of the Naval Service, Ottawa, Canada, 1920. 9½ x 6½ inches.

W. B. DAWSON. **Tidal Investigations: Results Deducible from the Tidal Observations.** Map. (Rept. of the Canadian Arctic Expedition, 1913-18, Vol. 10, Part C, pp. 3B-13 B.) Ottawa, 1920.

The first named paper treats the subject in a somewhat popular manner. It embraces the tide in general; the methods employed in the observations of tides and description of tidal curves; the causes of the tides; types of tides; the tides as modified by local conditions; and tidal streams as illustrated by Canadian examples. Attached to the paper are five plates illustrating the several types of tides as represented by observations at Canadian tidal stations.

Because of the scarcity of publications in English dealing with the subject of tides and tidal phenomena from the viewpoint of the layman, the present pamphlet is welcome. It is questionable, however, whether the treatment of the movements of sun and moon is not too detailed for the layman, and a like question might be raised as to the author's description of the types of tides. Furthermore, in describing tides he classifies them into three types—the synodic, the anomalistic, and the declinational. It is not certain that this classification will appear as clear to the layman as that of daily, semidaily, and mixed types.

The author calls attention to the scarcity of material dealing with the effect of wind on surface currents. In the observations made on currents in Canadian waters, where the tidal currents are generally of considerable magnitude, the current due to the wind is necessarily masked by the strong tidal effects. From this the impression might be gained that the effect of the wind in general is negligible; while, as a matter of fact, in localities where tidal currents are weak the current will generally set with the wind masking entirely the tidal effect.

The second paper covers the tidal investigations and results of the expedition (1914-1916) under the leadership of Mr. Vilhjalmur Stefansson.